عنوان مقاله:

Investigating the Effect of Titanium Addition on the Microstructure and Mechanical Properties of Ni-Hard 4 Cast Iron

محل انتشار:

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خلاصه مقاله:

Ni-Hard4 white cast iron is excellent wear resistant material and has been widely used in wearaffected equipment operated under extreme conditions, such as in mineral processing, cement, copper and iron manufacturing. In this study the effect of titanium addition (1.2, 0.7 and 0.2 wt.%) to the Ni-hard 4 cast iron with the nominal composition of Si= 1.5%, Mn=0.5%, C=3%, P=0.05%, S= 0.05%, Mo= 0.1%, Cr= 8% and Ni= 5.5% was investigated. This study was focused on the hardness, tensile strength, wear resistance and microstructural changes of the Ni-hard 4 cast iron. The results were compared with the Ni-hard 4 titanium free cast iron and demonstrated that the carbide morphology changes from rough plane to the flower leaf due to titanium addition. In addition, results showed that by increasing the percentage of titanium, hardness, strength and wear resistance is improved. In the samples with 1.3% titanium, the hardness, strength and wear resistance improved for 35, 22.5 and 85% respectively as compared with the titanium-free samples. This behavior is a consequence of the chromium carbide replacement with the hard titanium carbides as well as grain refining. Investigating the worn out surface of the samples showed that the predominant wear .mechanism is the combination of the adhesive and tibo-chemical

کلمات کلیدی:

Ni-Hard 4 Cast Iron, Titanium Carbide, Wear resistance, Hardness